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JANUARY 1973, NO. 1

FISHING INFORMATION

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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LA JOLLA, CALIFORNIA 92037

FISHING INFORMATION

JANUARY 1973, No. 1

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I. Barrett, Deputy Director
F. Hester, Director, Honolulu Laboratory

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

R. Michael Laurs, Leader
Fishery-Oceanography Investigations
La Jolla, California

Submitted for publication - February 16, 1973

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L. Eber (Figure 4), F. Miller (Figures 7, 8, and 9)
J. Renner (Figures 1, 2, 3, 5, and 6), J.F.T. Saur (Figures 10, 11 and 12)

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Pacific Environment Institute, Fisheries Research Board of Canada, West Vancouver, British Columbia, by H. J. Hollister from observations by S. G. Westhaver at Langara Island Light; J. Godin at Cape St. James Light; L. Collins at Kains Island Lightstation; O. A. Edwards at Amphitrite Point Light.
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Expendable bathythermograph observations are made by the Mates of the S. S. Hawaiian Enterprise of Matson Navigation Co., and processed with assistance from the NMFS Pacific Environmental Group, Monterey: Project partially supported by National Science Foundation Grant AG-256.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Northeastern Pacific

Sea surface temperatures in January 1973 showed a slight warming tendency relative to normal conditions in coastal waters north of 30°N, west to about 135°W. The largest deviations of coastal temperatures from normal were found, as in December, along the central portion of Baja California (Figure 5) and reached values of 4°F (2.2°C).

In the central region of the eastern North Pacific, cooling processes continued to erode the anomalous warm condition persisting since mid-Autumn. The geographic area represented by positive deviations of 2°F (1.1°C) is considerably smaller than it was in December.

The mean barometric pressure in January was below normal by amounts up to 8 millibars in the Gulf of Alaska and southward to latitude 40°N (Figures 1 and 2). This reflects intense cyclonic activity in and south of the Gulf of Alaska, particularly during the period of January 10-15. Further cyclonic storm activity occurred after January 21 when a second series of low pressure systems moved into the Gulf of Alaska and intensified. These developments were accompanied by strong southerly winds from the coast out to 140°W, northward of 35°N, and strong northerly winds to the west of the low pressure centers, which contributed to modification of the anomalous temperature pattern through wind stress.

In brief, the effects of wind induced heat advection, along with other air-sea interaction processes, were evidenced by weakening of the anomalous sea surface temperature pattern which has persisted during the past few months.

Eastern Tropical Pacific

A positive sea surface temperature anomaly continued to dominate an extensive part of the eastern tropical Pacific between 10°N and 10°S during January 1973. In December the magnitude of this anomaly increased over that in November along the coast of South America and over the equatorial area out to 120°W. However, this month the positive anomalies decreased about 2°F (1.1°C) along the coast of South America from 3°S to 12°S. To the west of 90°W between 10°S and 2°S, there was a 4°F to 6°F (2.2°C-3.3°C) reduction in the positive anomaly. This series of events, particularly at coastal stations and at equatorial island stations resembles the corresponding period of the 1957-58 El Nino.

The sea surface pressure gradient (based on National Weather Service maps) increased significantly between 30°S, 90°W and the coast of South America at 14°S in January. This suggests that the southeast trades have become re-established again along coastal areas. In November and December the southeast trade winds were weak. Although ship observations near the coast of South America are sparse, sea surface temperatures recorded at coastal stations from Chile to northern Peru indicate a gradual cooling of coastal surface waters. This appears to be a reflection of renewed upwelling in response to the southeast trades. Equatorial waters continue to show large warm anomalies between 80°W and 140°W; but the area covered by anomalies greater than 4°F (2.2°C) appears to be shrinking.

North of 7°N there has been a significant decrease in the sea surface temperature since December. This is reflected in the anomaly pattern and was associated with persistent strong northeast trade winds caused by frequent passages of high pressure areas which followed active frontal systems into the subtropical areas of the eastern Pacific and Gulf of Mexico.

Subsurface Temperature Structure in the Northeast Pacific Ocean

J. F. T. SAUR

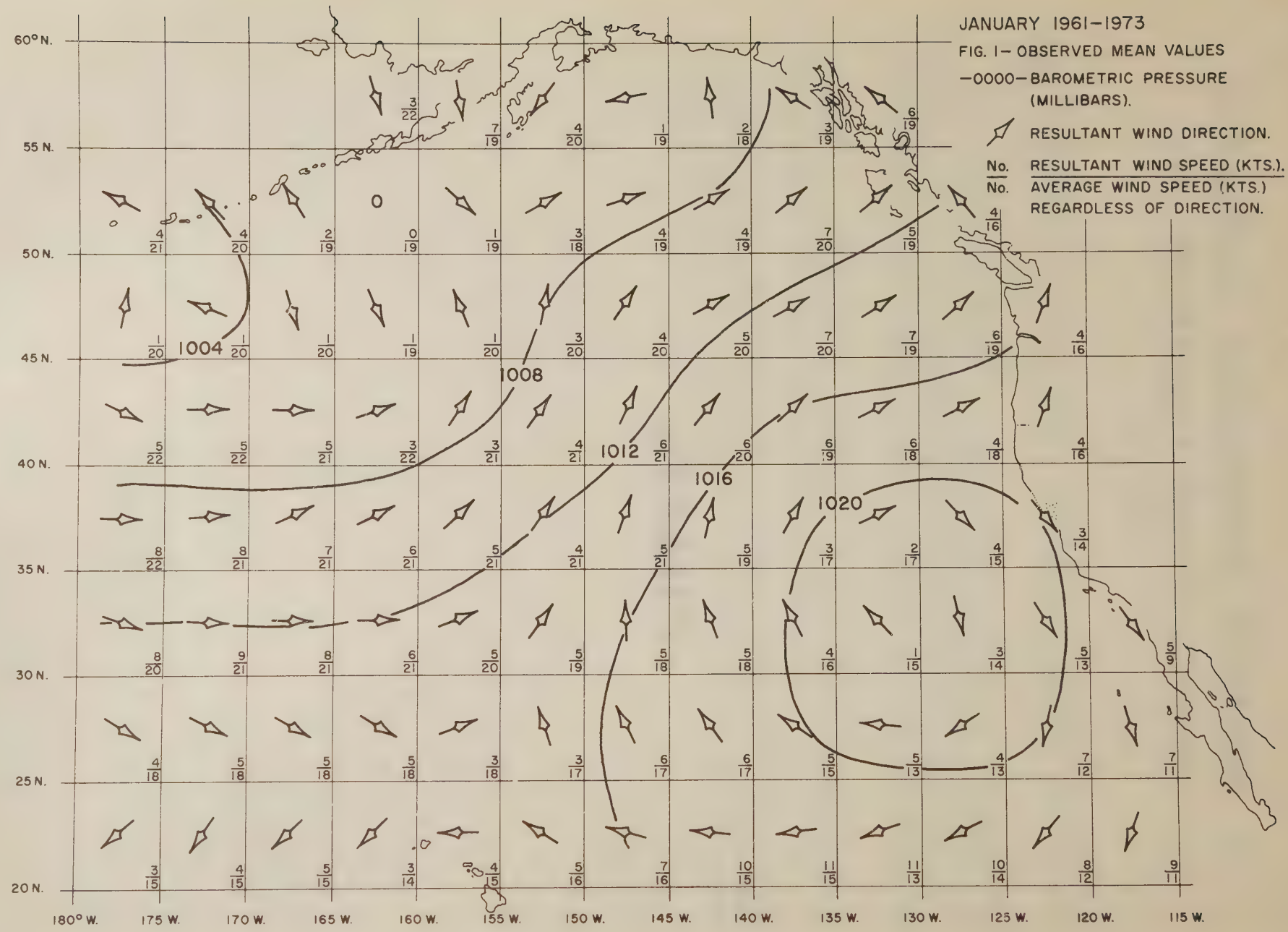
Three sections of sub-surface temperatures, Figures 10, 11, and 12, show the wintertime conditions from late December 1972 through mid-January 1973. The general sub-surface thermal structure shows no large changes through the period.

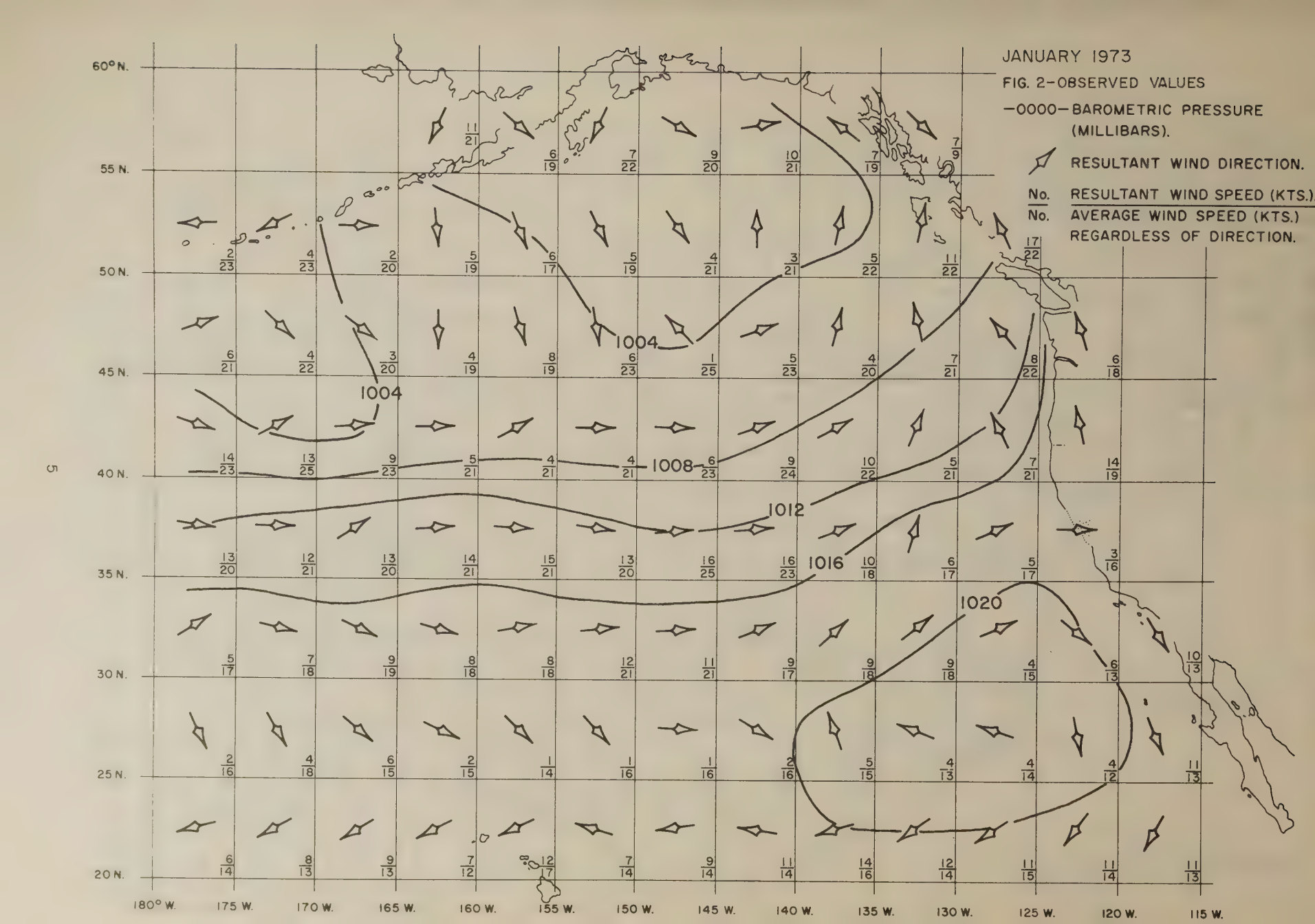
The sub-surface maximum-minimum structure sometimes used to help identify the transition zone was weak and variable during the period. In early January (Figure 11) a cool surface layer rested upon a warmer layer just above the main thermocline at Stations 8 and 9 but had disappeared by late January (Figure 12). Wind accompanying winter storms appeared to be strong enough to overcome the stability associated with cool low salinity water overlying more dense warm high salinity water. The mixing dissipates the maximum-minimum structure in the vertical profile of temperature.

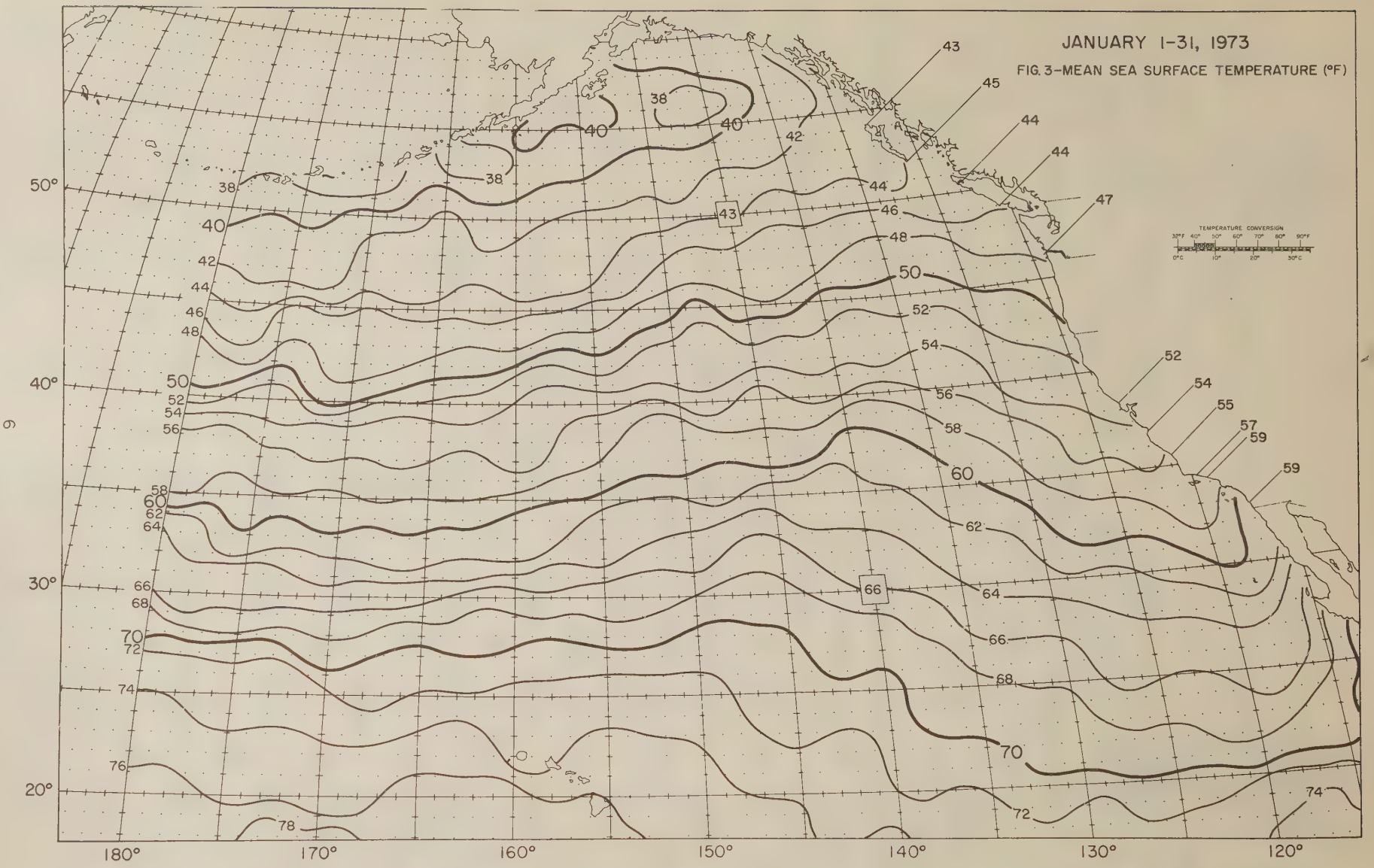
The strongest southward flow in the California Current, indicated by the sharpest descent of the thermocline, proceeding offshore, is between 500 and 600 miles from the coast. This is accompanied also by relatively strong horizontal temperature gradients in the surface mixed layer.

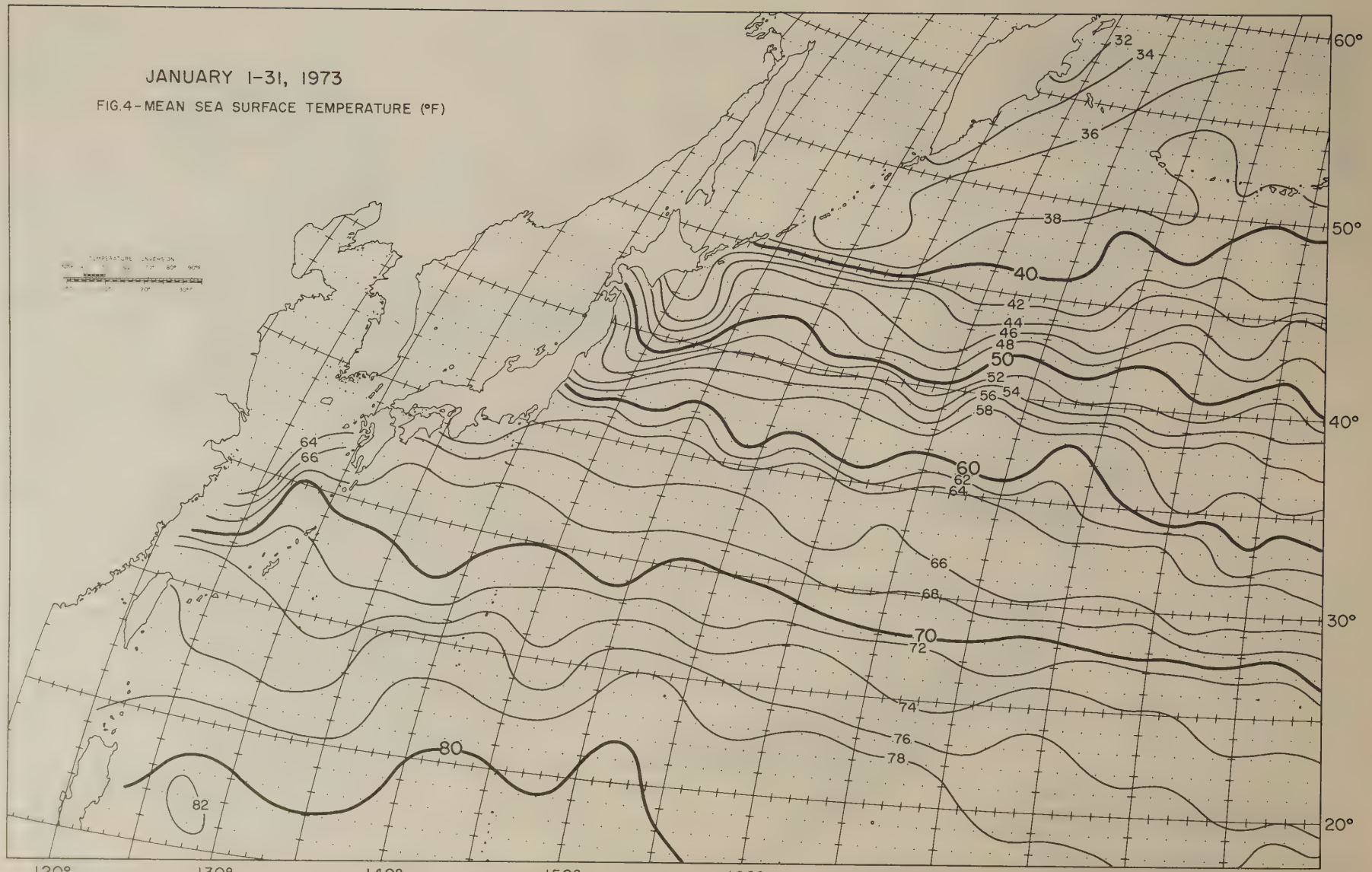
Surface layer depths increased slightly from 60-80 meters in December to 70-90 meters by late January. The deepest surface layers, about 100 meters, continue to occur about 1000-1100 miles from the coast around 142°W longitude. The average temperature of the top 100 meters across the section (a measure of heat content), decreased by about 0.5° to 1.0°C.

CHARTS


JANUARY 1961–1973
FIG. 1– OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


JANUARY 1973
FIG. 2-OBSERVED VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


JANUARY 1-31, 1973
FIG. 3-MEAN SEA SURFACE TEMPERATURE (°F)
TEMPERATURE CONVERSION
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


JANUARY 1-31, 1973
FIG.4-MEAN SEA SURFACE TEMPERATURE (°F)
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°

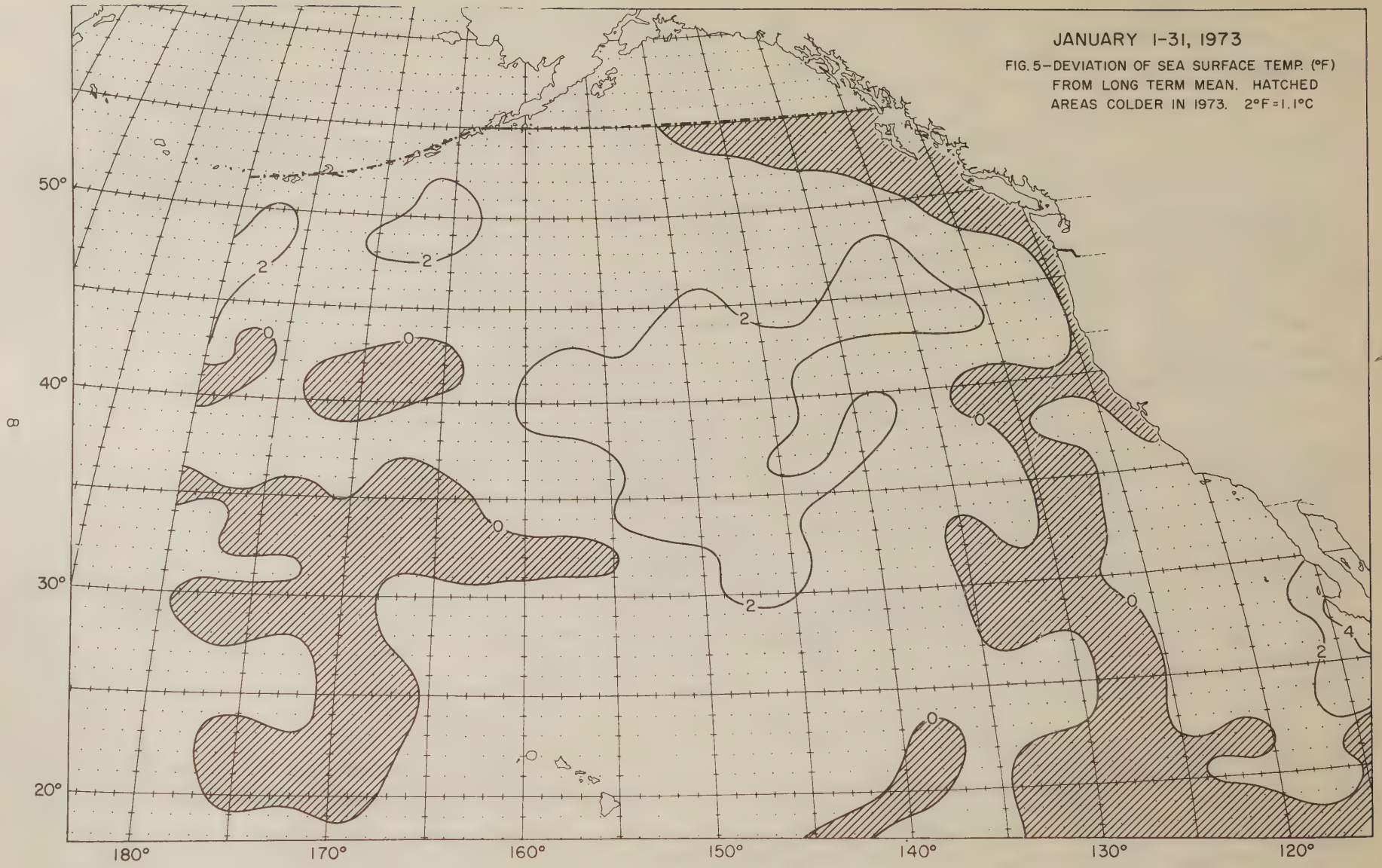

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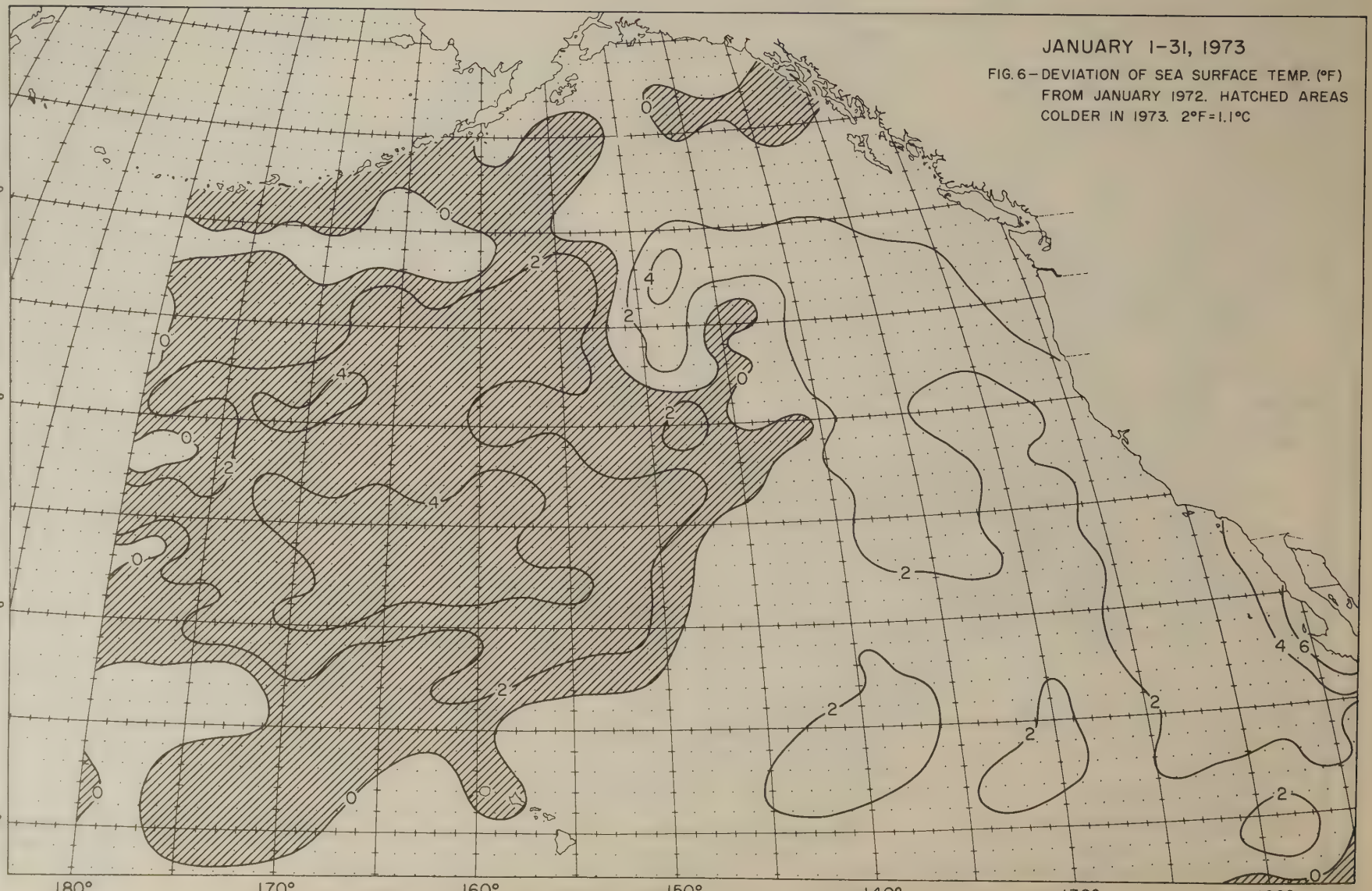
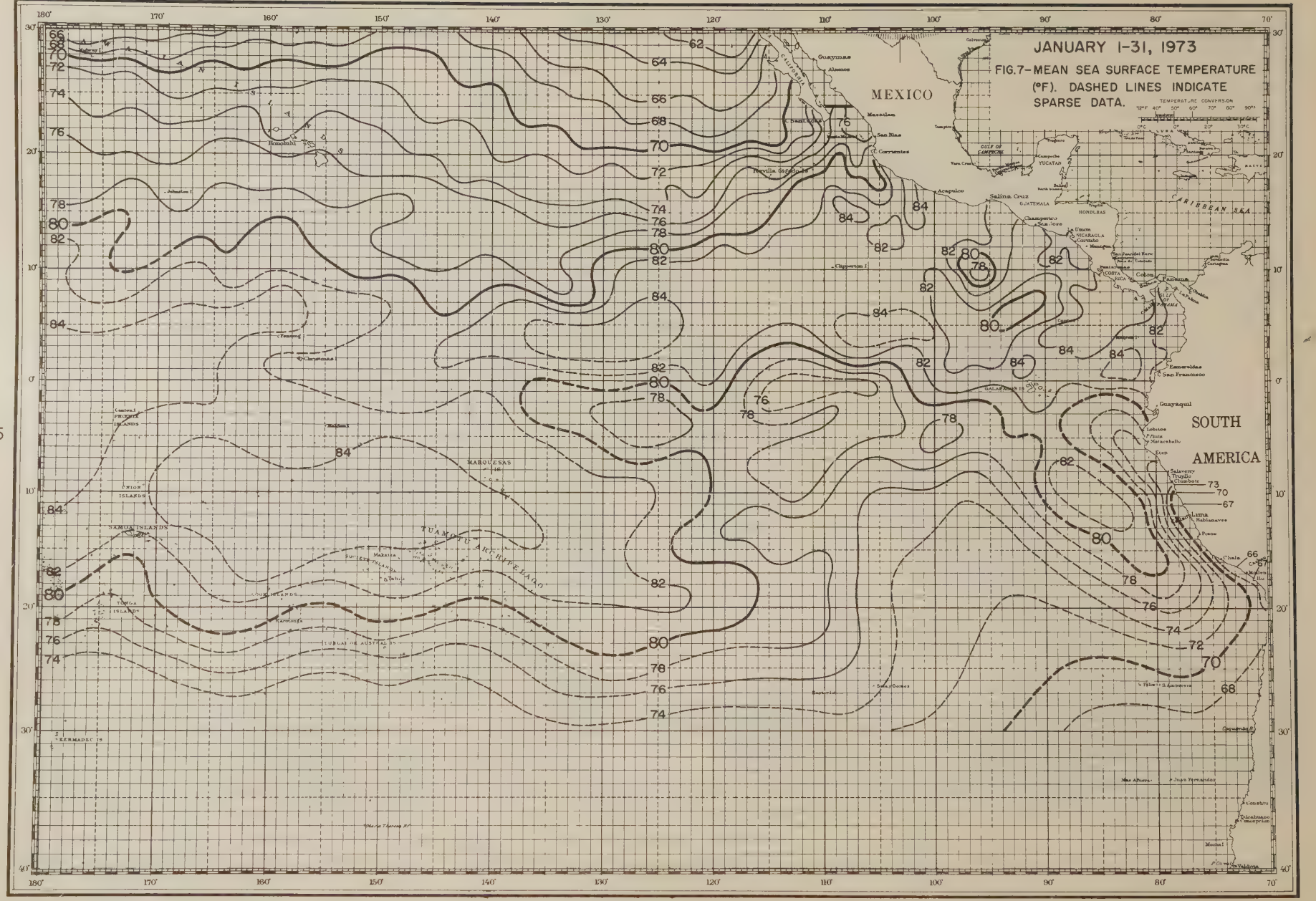
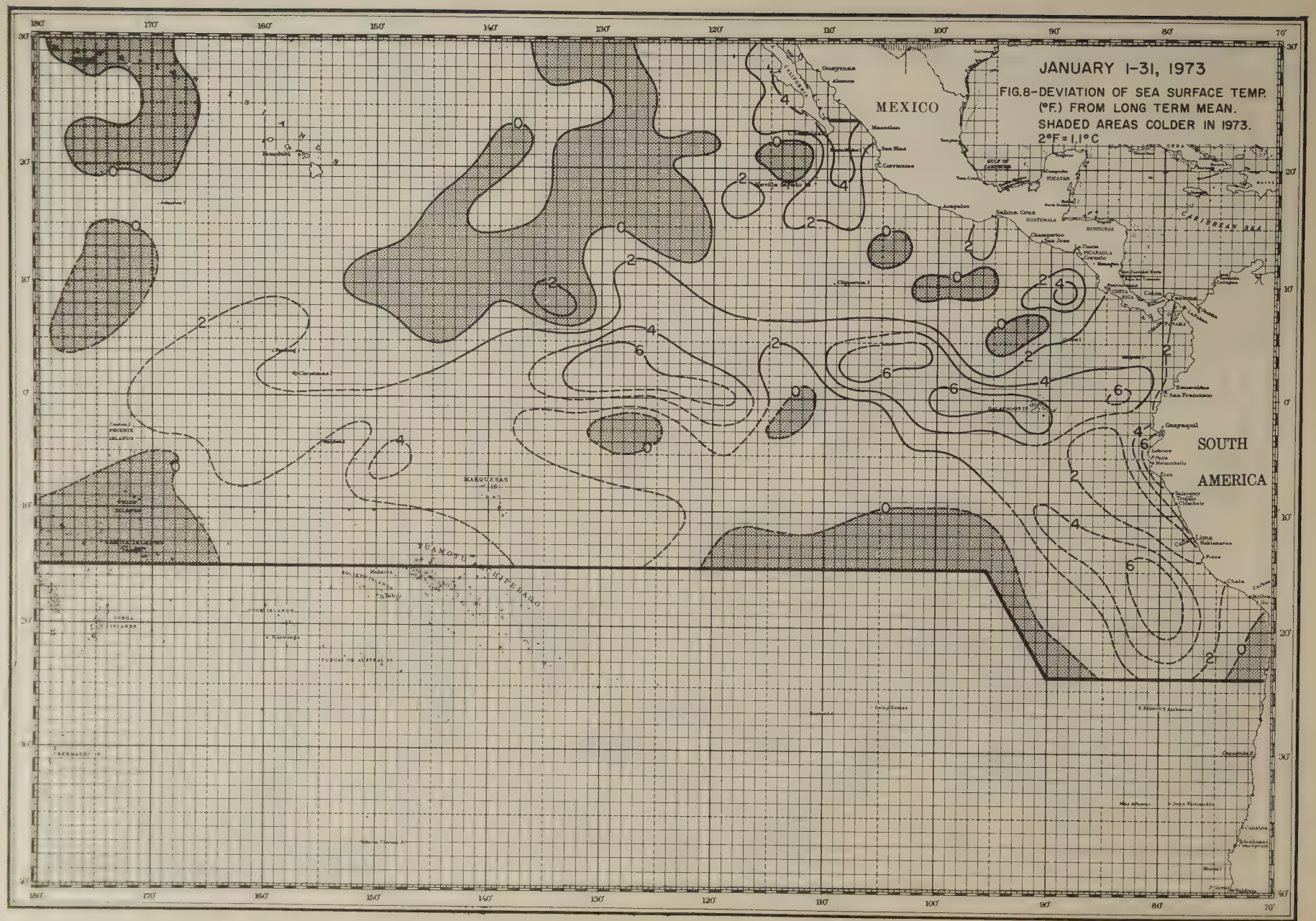
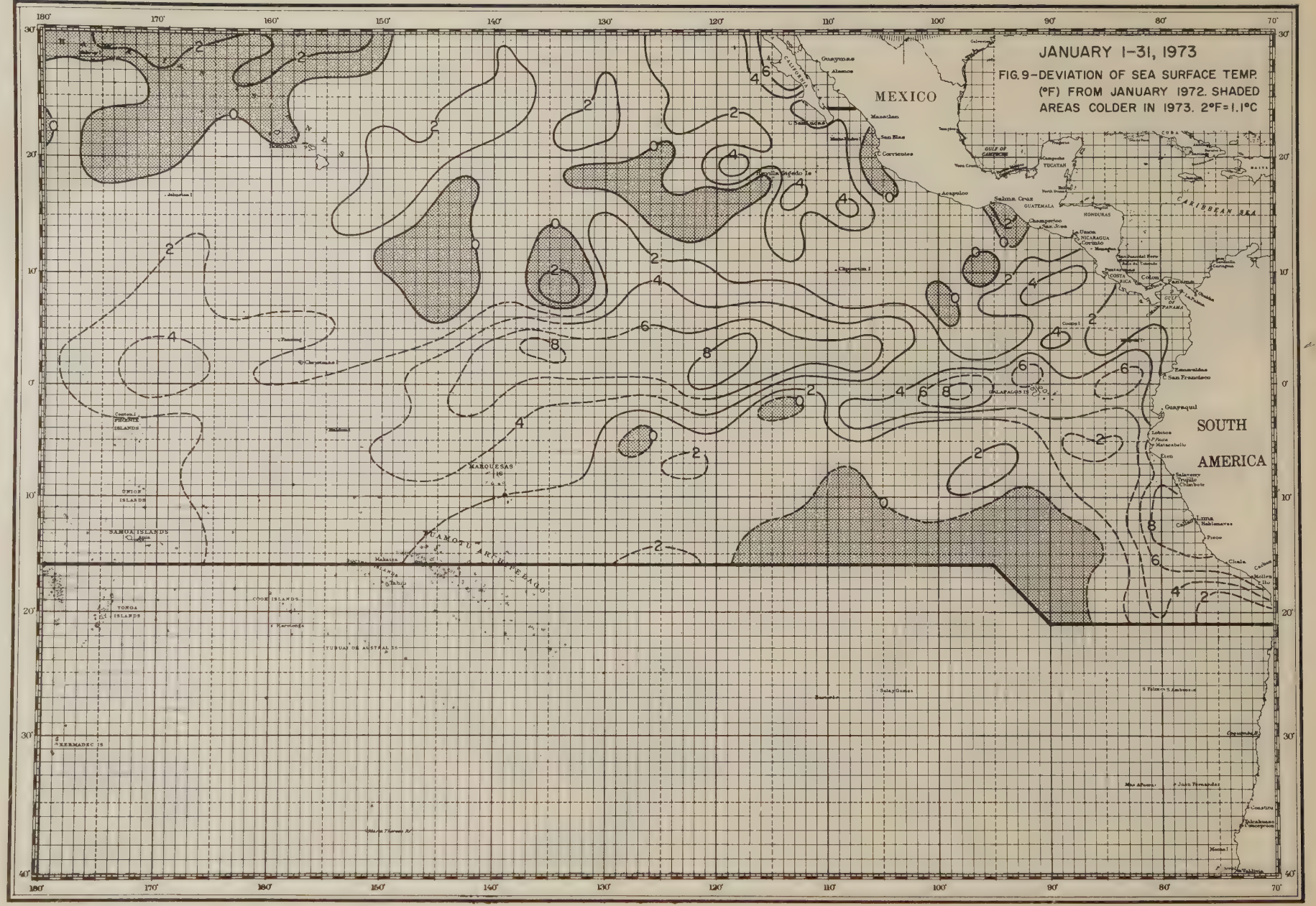
FIG. 5-DEVIATION OF SEA SURFACE TEMP. (°F) FROM LONG TERM MEAN. HATCHED AREAS COLDER IN 1973. 2°F=1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
2
0
4


JANUARY 1-31, 1973
FIG. 6 – DEVIATION OF SEA SURFACE TEMP. (°F) FROM JANUARY 1972. HATCHED AREAS COLDER IN 1973. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

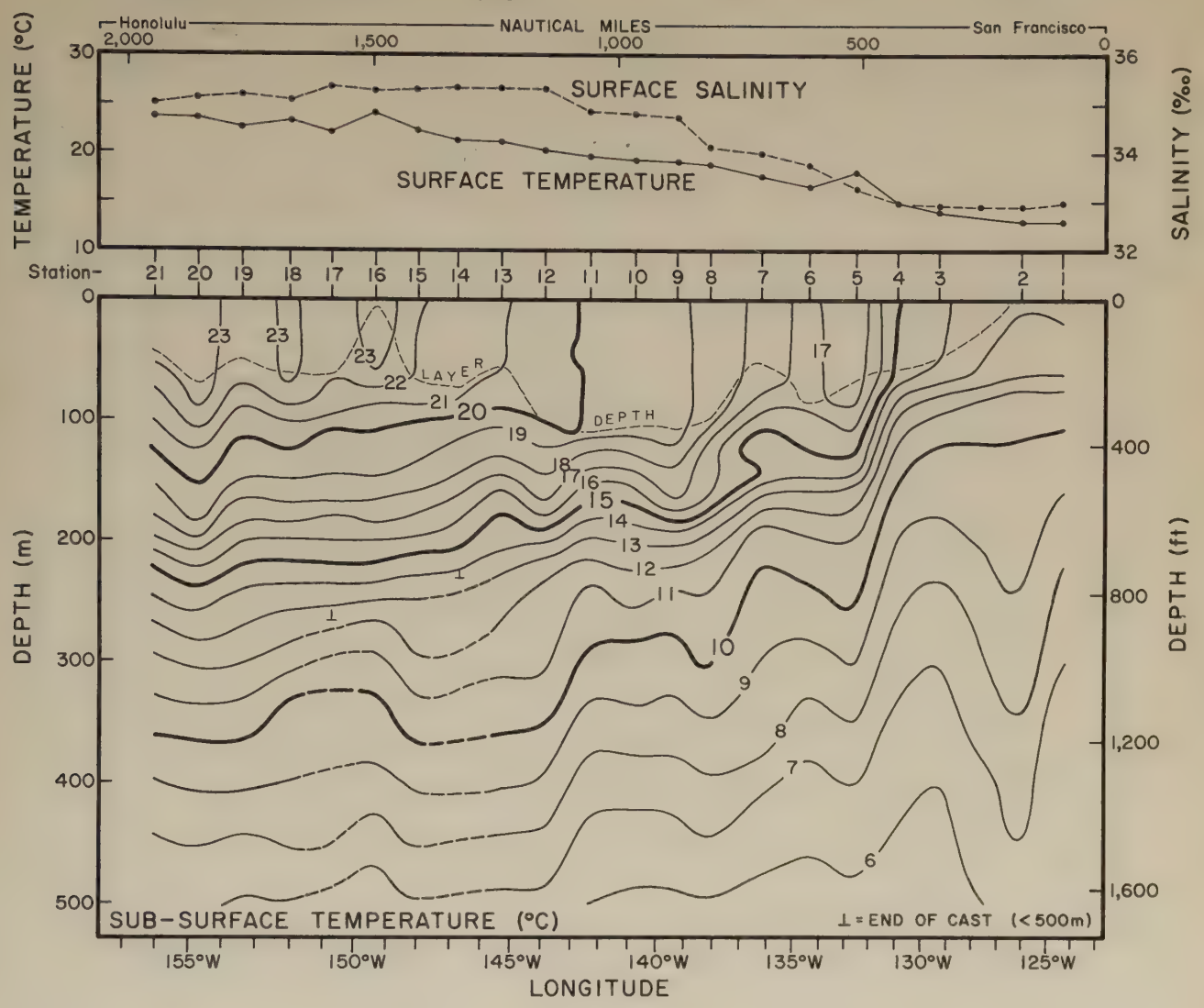

JANUARY 1-31, 1973
FIG.7-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
GALAPAGOS IS.
MARQUESAS
SAMOA ISLANDS
TONGA ISLANDS
TUAMOTU ARCHIPELAGO
TUBUAI OR AUSTRAL IS.
Guaymas
Mazatlan
San Blas
Corrientes
Acapulco
Salina Cruz
Champerico
Corinto
Cocos
Panama
San Francisco
Guayaquil
Salaverry
Trujillo
Chimbote
Lima
Callao
Chile
Valparaiso
Juan Fernandez
Easter I.
Clipperton I.
Socorro I.
Revilla Gigedo Is.
Galapagos
Marquesas
Samoa Islands
Tonga Islands
Tuamotu Archipelago
Tubuai or Austral Is.
Bermadec Is.
Pitcairn I.
Easter I.
Juan Fernandez
Mas A Tierra
Mocha I.
Yaldivia
Concepcion
Talcahuano
Coquimbo
Arica
Iquique
Callao
Lima
Chimbote
Salaverry
Guayaquil
Panama
Cocos
Corinto
Champerico
Salina Cruz
Acapulco
Corrientes
San Blas
Mazatlan
Guaymas
Socorro I.
Clipperton

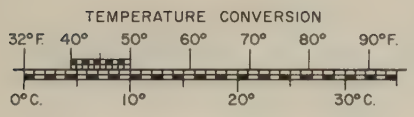

JANUARY 1-31, 1973
FIG.8-DEVIATION OF SEA SURFACE TEMP. (°F.) FROM LONG TERM MEAN.
SHADED AREAS COLDER IN 1973.
2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
MARQUESAS
TUAMOTU ARCHIPELAGO
Guaymas
Mazatlan
San Blas
Acapulco
Salina Cruz
Guayaquil
Lima
Callao
Pisco
Chala
Arica
Iquique
Valparaiso
Juan Fernandez
Easter I.
Pitcairn I.
Rapa
Tahiti
Rarotonga
Penrhyn I.
Christmas I.
Fanning I.
Palmyra I.
Johnston I.
Canton I.
PHOENIX ISLANDS
TONGA ISLANDS
COOK ISLANDS
KERMADEC IS.
Honolulu
Clipperton I.
Cocos I.
Malpelo I.
Gorgona I.
Gallapagos Is.
Panama
Colon
Cartagena
Maracaibo
Puerto Cabello
La Guaira
Trinidad
Barbados
Curacao
Aruba
Jamaica
Haiti
CUBA
GULF OF CALIFORNIA
GULF OF TEHUANTEPEC
GULF OF PANAMA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
YUCATAN
Veracruz
Tampico
Manzanillo
Acapulco
Champerico
San Jose
Corinto
Puntarenas
Buenaventura
Tumaco
Esmeraldas
San Francisco
Salaverry
Trujillo
Chimbote
Callao
Mollendo
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Mas Afuera
Juan Fernandez
Concepcion
Talcahuano
Valdivia
Mocha I.
Easter I.
Sala y Gomez
S. Felix
S. Ambrosio
Rapa
Tahiti
Makatea
Rarotonga
Penrhyn I.
Christmas I.
Fanning I.
Palmyra I.
Johnston I.
Canton I.
Enderbury


JANUARY 1-31, 1973
FIG. 9-DEVIATION OF SEA SURFACE TEMP. (°F) FROM JANUARY 1972. SHADED AREAS COLDER IN 1973. 2°F=1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GULF OF CALIFORNIA
GULF OF PANAMA
GALAPAGOS IS
MARQUESAS
SAMOA ISLANDS
TUAMOTU ARCHIPELAGO
COOK ISLANDS
TONGA ISLANDS
PHOENIX ISLANDS
LINE ISLANDS
BERMUDA IS
Acapulco
Salina Cruz
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
Panama
Colon
Guayaquil
Lima
Callao
Pisco
Chala
Mollendo
Arica
Iquique
Antofagasta
Valparaiso
Juan Fernandez
Easter I
Tahiti
Pitcairn I
Raroia
Makatea
Manihiki
Penrhyn
Palmerston
Suwarrow
Nassau
Christmas
Fanning
Jarvis
Malden
Starbuck
Caroline
Flint
Vostok
Clipperton I
Cocos I
Johnston I
Hawaii
Honolulu
Midway Is
Wake I
Guam
Saipan
Yap
Palau Is
Truk
Ponape
Kusaie
Eniwetok
Kwajalein
Majuro
Jaluit
Ocean I
Nauru
Tarawa
Funafuti
Nukufetau
Nanumea
Nanumanga
Niutao
Nukulaelae
Vaitupu
Nukufetau
Rotuma
Fiji
Suva
Viti Levu
Vanua Levu
Tonga
Nuku'alofa
Niue I
Aitutaki
Rarotonga
Mangaia
Tubuai Is
Rapa
Pitcairn I
Henderson I
Ducie I
Oeno I
Gambier Is
Tuamotu Archipelago
Society Is
Tahiti
Moorea
Bora Bora
Huahine
Raiatea
Tahaa
Maupiti
Tubuai
Rurutu
Rimatara
Raivavae
Austral Is
Rapa
Marcus I
Minami-Tori-Shima
Wake I
Eniwetok
Kwajalein
Majuro
Jaluit
Ocean I
Nauru
Tarawa
Funafuti
Nukufetau
Nanumea
Nanumanga
Niutao
Nukulaelae
Vaitupu
Rotuma
Fiji
Suva
Viti Levu
Vanua Levu
Tonga
Nuku'alofa
Niue I
Aitutaki
Rarotonga
Mangaia
Tubuai Is
Rapa
Pitcairn I
Henderson I
Ducie I
Oeno I
Gambier Is
Tuamotu Archipelago
Society Is
Tahiti
Moorea
Bora Bora
Huahine
Raiatea
Tahaa
Maupiti
Tubuai
Rurutu
Rimatara
Raivavae
Austral Is
Rapa
Marcus I
Minami-Tori-Shima
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°
40°

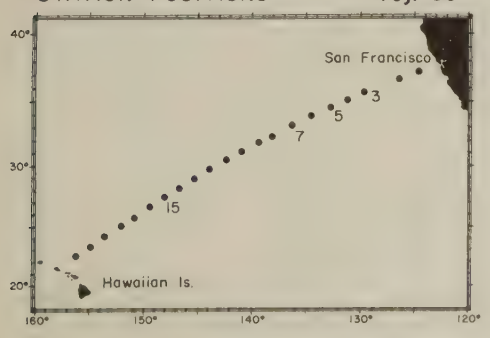
DECEMBER 24-28, 1972
SS HAWAIIAN ENTERPRISE, Voyage 55

FIGURE 10.

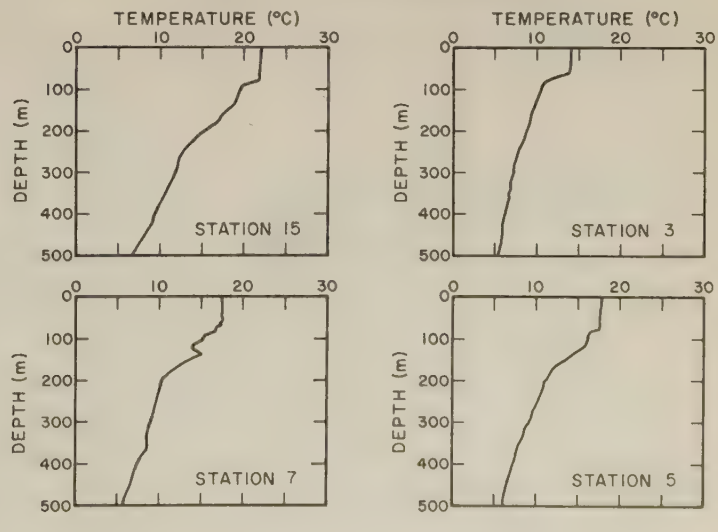




STATION POSITIONS Voy. 55

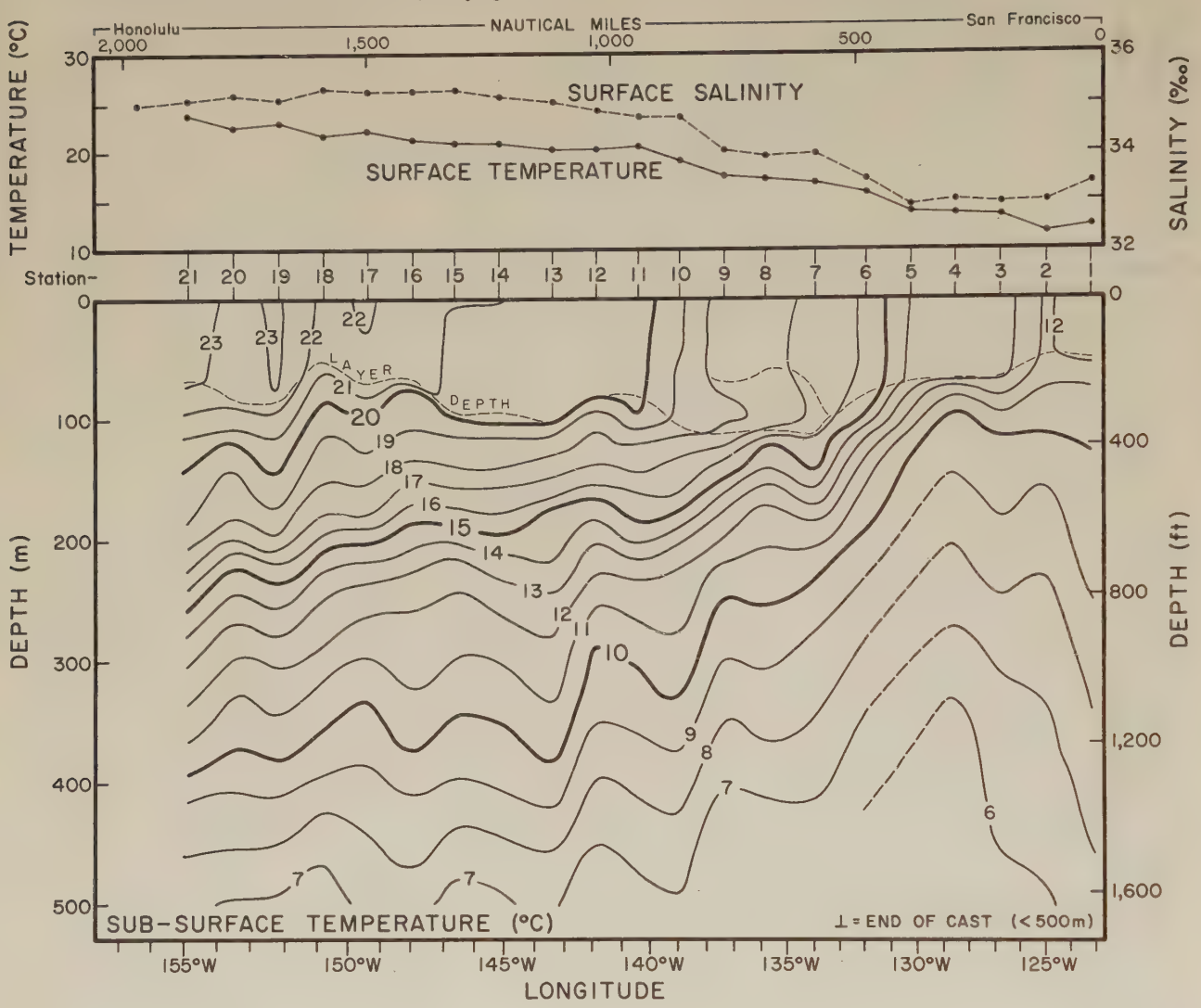


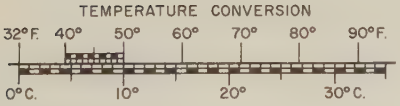
SELECTED STATION PROFILES



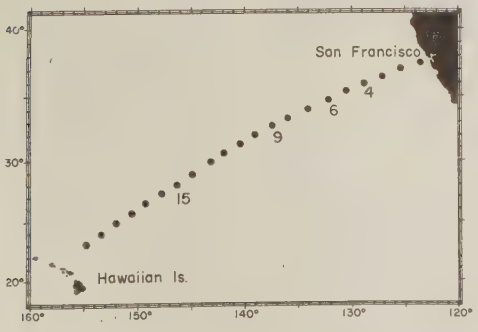
JANUARY 6-9, 1973
SS HAWAIIAN ENTERPRISE, Voyage 56

FIGURE 11.





STATION POSITIONS Voy. 56



SELECTED STATION PROFILES

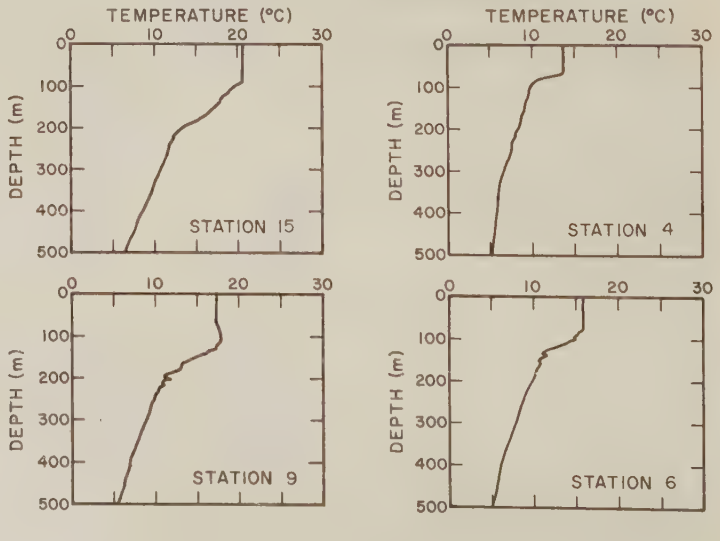


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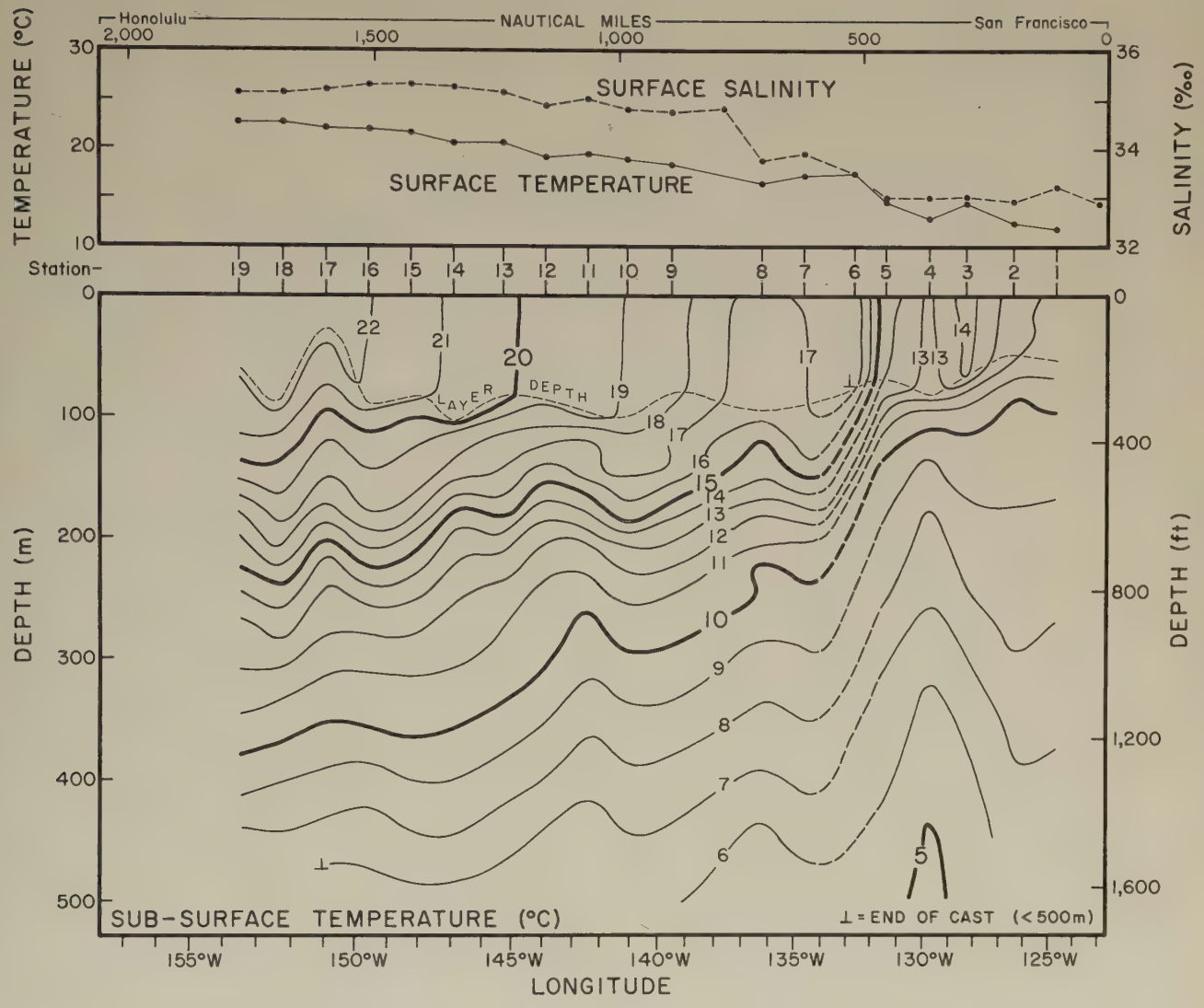
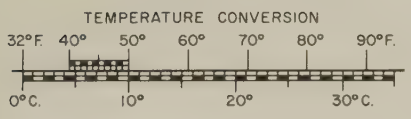
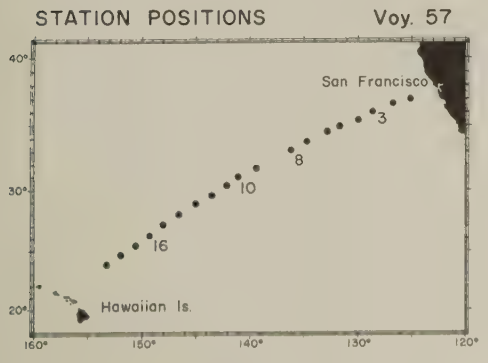
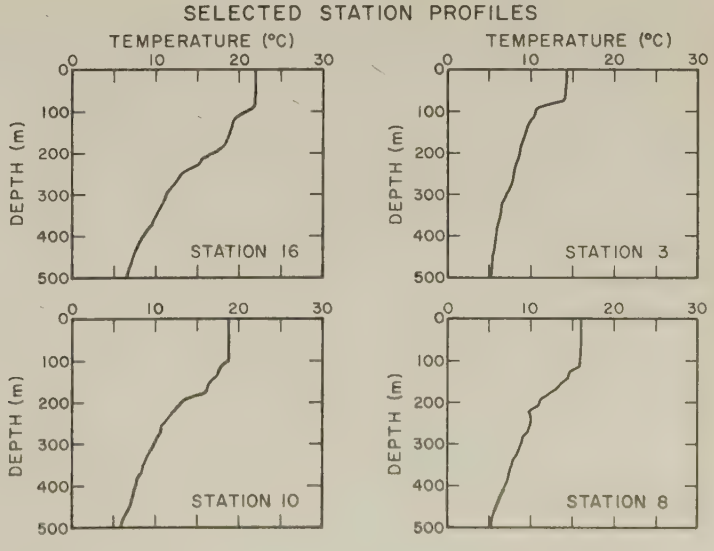
FIGURE 12.

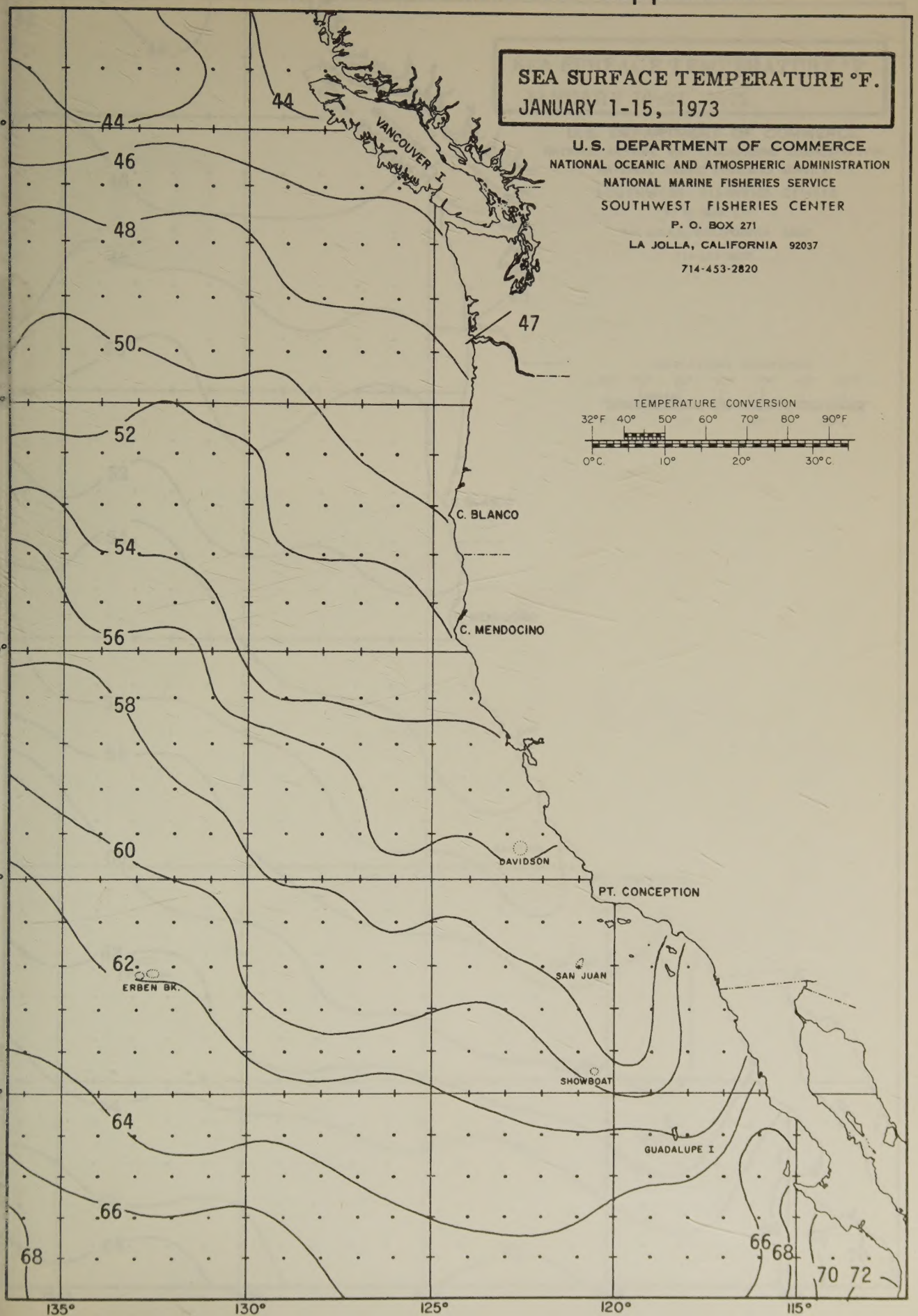








FISHING INFORMATION – supplement



FISHING INFORMATION – supplement